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ADMINISTRATION AND REGULATION OF NOISE IN ALBERTA

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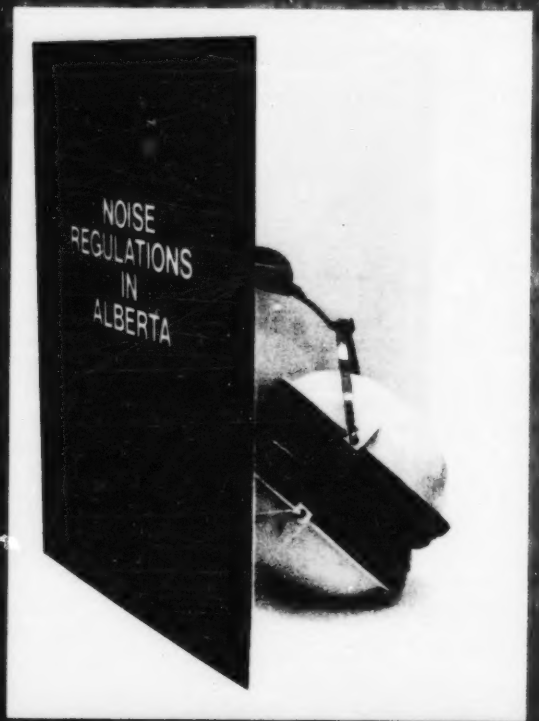

Alberta
ENVIRONMENT COUNCIL OF ALBERTA

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ADMINISTRATION AND REGULATION OF NOISE IN ALBERTA

December 1980

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INTRODUCTION

Attempts to control community noise date at least as far back as the early Romans, who prohibited chariot racing at night. Noise was considered a nuisance interfering with the normal activities of community members. But within the last few decades, the tremendous changes propelling society into the space age have been accompanied by much more noise. The growing numbers of appliances in our homes, word processing equipment in offices, and heavy machinery in industry, to name only a few noise sources, increasingly intrude upon all aspects of our lives. Noise is not just a nuisance, it is now considered hazardous to the health of individuals and society as a whole.

Noise affects our health and welfare in many ways. Not only does noise cause hearing loss, but evidence is mounting that noise interferes with speech, learning, and thought processes, interrupts sleep patterns, and elicits undesirable psychological and physiological reactions. Though it is difficult to attribute these health problems to the effects of noise alone, high noise levels are recognized as an environmental influence contributing to the problems. Recent attempts to regulate various noise sources are the result not only of increasing ambient noise levels, but also of an increasing understanding of the effects of noise on people.

Traditionally, the regulation of noise has focused on the prohibition of specific activities, such as "hallooing, crying aloud or...the creation of any disturbance or noise on any public street" (Lloydminister [sic] Bylaw No. 780, 1950, p. 1). The growing trend to treat noise as a health hazard, however, implies the need to set "safe limits". Development of explicit regulations specifying exposure limits and mandatory attenuation measures not only protects the unaware but also the short-sighted, who would ignore potential problems.

Results from regulation, however, come slowly in the best of times. And regulation of noise faces a number of political, jurisdictional, technical, and enforcement problems. First, because legislation reflects the political climate, changing political conditions frequently emasculate bylaws or regulations which previously were considered desirable. Second, from a jurisdictional viewpoint, the Canadian constitution is vague about the distribution of responsibility for noise control and "even within the same jurisdiction, governmental tradition and departmental jealousies have prevented the development of a rational and integrated system of noise regulation" (McLaren 1979, p. 16). Third, from a technical point of view, in order to establish noise exposure limits, reliable scientific data is required. This poses difficulties as most of the data, to date, are "from practical, non-perfect situations where required controls could not be maintained" (Benwell and Repacholi 1979, p. 68). Finally, it is not uncommon for noise bylaws to flounder on enforcement problems which may, or may not, be related to changing political climate or technical inadequacies. In Calgary, for example, after a flurry of activity immediately following adoption of the noise abatement bylaws, "the pace seems to have slackened, as a result of both lack of human resources and police complaints that the noise bylaw is difficult to enforce" (McLaren 1979, p. 22).

The purpose of this bulletin is to describe the involvement of all levels of government in the regulation and administration of noise in Alberta. Following a brief discussion of the relative merits of attempting to solve noise problems through common law and statute law, the three levels of government involvement, municipal, provincial, and federal, will be surveyed in detail. A final international perspective is intended to introduce an element of comparison against which Canadian and Albertan regulations may be measured, as well as stress the need for international cooperation. The last chapter discusses a variety of views regarding current administration and regulation of noise in Alberta. These views are intended to help stimulate critical questioning of the material documented in this bulletin — why has the administration and regulation of noise evolved the way it has? Are current regulations and administrative practices effective? Where and how can they be improved? The upcoming Public Hearings on all aspects of noise pollution and its control in Alberta will provide an opportunity for Albertans to express their views on these questions.

LEGAL SOLUTIONS TO NOISE PROBLEMS

Resolving noise problems within a legal framework may follow one of two routes: civil action using Common Law, or legislative and regulatory controls pursuant to Statute Law.

CIVIL ACTION

The most common form of civil action regarding noise is the action of private nuisance. This approach enables a person to seek injunction or damages for a neighbour's (residential or industrial) unreasonable interference with the use and enjoyment of one's property. Noise, smells, and dust are the classic examples of nuisances.

On the positive side, civil actions and remedies can be very flexible. Successful cases have involved noise from steam hammers, generators, motor vehicles, and aircraft. Remedies usually require that the annoying activity be stopped, a solution environmentally preferable to fines. There are a number of obvious drawbacks, however. They include: inconsistency of application, high costs of litigation if the action is unsuccessful, the preference of the Court for proof of damage rather than mere inconvenience, the likelihood that the action will be time consuming, and the possibility of a defendant's unfair advantage in the "war of witnesses" if the defendant is, for example, a large corporation with seemingly unlimited resources. The strongest objection, from an administrative point of view, is usually based on the reactive nature of this approach, as opposed to a more constructive attempt to influence improved behaviour (McLaren 1979, pp. 16-17).

Would you consider Civil Action to be an appropriate way to solve any of your noise problems?

STATUTORY ACTION — DIVISION OF POWERS IN CANADA

Civil actions generally cannot provide adequate protection from increasing problems of noise. Federal and provincial governments, therefore, have proclaimed a few statute laws, and municipal governments have adopted bylaws, to regulate noise within their jurisdictional limits. With this approach, the onus is on the adopting level of government to enforce its own laws.

The problem, however, is to define each level's jurisdictional limits. Allocation of responsibility for regulation of noise in Canada is vague. Noise, or its control, is not specifically mentioned in the British North America (BNA) Act (1867, ss. 91 and 92). Early development of legislation relating to noise saw the provinces providing "enabling" legislation, giving municipalities the power to enact nuisance bylaws. More recently, with increasing interest from federal and provincial governments to assume responsibility for controlling noise, noise is being treated as a concomitant of other activities which explicitly fall within their jurisdiction. In general terms, the Federal Government assumes responsibility for matters affecting marine transportation, rail transportation, air transportation, national health and safety, trade and commerce, and some aspects of the environment. The provinces have jurisdiction over local works, property and civil rights, and all matters of a local or private nature, including municipal authority which is delegated by the provinces. The extent to which each of the three levels of government exercise noise control responsibility will be detailed in the next three chapters.

To what extent do you think the various levels of government should attempt to control noise in Alberta?

LOCAL RESPONSIBILITY — MUNICIPAL AND REGIONAL GOVERNMENTS

Municipal governments often adopt bylaws to regulate specific community noise problems. Formulation of these provisions usually is simple, although a number of relatively recent municipal bylaws stipulate permissible noise levels in decibels. Also, at the municipal level, noise considerations may be implicit in planning procedures. Environmental factors, such as noise, frequently are incorporated into general land use decisions.

MUNICIPAL BYLAWS

Several Alberta statutes enable municipalities to enact bylaws to abate noise and/or nuisances. The Municipal Government Act (R.S.A. 1970, c. 246, s. 157 (1) (g)) specifically enables municipal councils to pass bylaws for the purpose of prohibiting, eliminating, or abating noise. These bylaws may establish permissible noise levels for all, or varying periods, of the day, in all or a designated part of the municipality. Section 157 (1) (a) more generally permits bylaws designed to prevent nuisances. The Highway Traffic Act (S.A. 1975, c. 56, s. 14(7)) enables councils, with respect to highways under their direction, control, and management, to make bylaws for the regulation and control of vehicle traffic. Pursuant to this Section, municipalities may define what constitutes objectionable noise, devise a system or method of determining or measuring such noise, and prohibit the operation of motor vehicles which, in any manner, make objectionable noise.

Several types of municipal noise bylaws exist in Alberta. For example, the Edmonton (1973) and Calgary (1974) noise abatement bylaws are frequently cited examples of decibel bylaws. Edmonton Bylaw No. 4110 (1973) states that it is intended to "prevent deterioration of the noise environment in this City and to adopt as the acceptable noise level a reading in dbA units according to a sound level meter used as herein provided". The bylaw makes provision for several types of noise problems. It prohibits loud, unnecessary, or unusual noise that disturbs the comfort of other persons. Sound level limits, in decibels, are established for various types of

vehicles: vehicles under 6,000 pounds - 83 dbA; motorcycles - 83 dbA; vehicles over 6,000 pounds - 90 dbA; and diesel powered motor vehicles - 92 dbA. Permissible noise levels in residential zones are established at 65 dbA daytime and 50 dbA nighttime. A maximum sound level of 75 dbA is established for commercial and industrial zones, with provisions for louder temporary intermittent noises. Penalties for violation depend on the extent by which the maximum levels are exceeded.

The stated intent of Calgary By-law No. 9024 (1974) is "that all noise shall be reduced as far as possible compatible with the normal activities of urban life and that unnecessary noise be eliminated". It too makes provisions for several types of noise problems. The general prohibition is similar to Edmonton's with additional caution to any person making a sound not specifically restricted by any legislation, but disturbing to other people, to do so as quietly as practicable. With regard to motor vehicle noises, maximum noise intensities, in dbA, are established for various classes of vechicles, varying with lawful speed limit. Commercial and industrial noise prohibitions focus on restricting the loading of trucks during nighttime within two blocks of a residential district, and restricting advertising by audible means. The domestic noise section of this bylaw prohibits operating power lawn mowers, model aircraft with internal combustion engines, and engine-powered snow clearing devices during nighttime hours, or allowing animals to disturb neighbours. Day and nighttime maximum sound levels are also stipulated for air conditioners, and there has been a gradual diminution of levels from 60 dBA (day and night) in 1973 to 50 dbA (day) and 45 dbA (night) by 1977. And finally, construction noises are prohibited during nighttime except in agricultural and industrial zones, or if authorized by the city. Fines increase with repeated violation.

Lethbridge By-law No. 2821 (1969) and Medicine Hat By-law No. 1720 (1975) are similar in many ways to the Calgary noise bylaw, except that the Lethbridge bylaw does not specify decibel measurements. The vast majority of noise-related municipal bylaws, however, are very simple documents prohibiting specific noises depending on the needs and desires of different localities. Common wording of such bylaws includes prohibiting "any gramophone, radio, megaphone or other device or musical instrument to be sounded or used on any public street" (Lloydminister [sic] By-law No. 780, 1950, p. 1), prohibiting "to be blown or sounded . . . the steam whistle of any locomotive" (Camrose By-law No. 463,1942, p. 1), or simply prohibiting the making of "any unusual or unnecessary noise likely to disturb persons in his neighbourhood" (Grande Prairie By-law C-502, 1974, p. 1).

Does your community have a noise abatement bylaw?

Are you familiar with its prohibitions?

Have you ever requested to have it enforced?

Enforcement of municipal noise bylaws is usually a police responsibility. In the case of Edmonton and Calgary, however, where the bylaws are much more comprehensive than in most other municipalities, police enforcement is with reference to vehicle and public nuisance complaints. Municipal Bylaw Enforcement Departments, in conjunction with Local Boards of Health, receive complaints about stationary noise sources, such as industrial and construction generated noise. For example, Edmonton Bylaw Enforcement Department receives about 30 to 40 complaints a month, primarily during the summer months. Enforcement officers investigate the specific complaints. If an actual noise level measurement is required, the case is referred to the Local Board of Health who has the technical capability to take audiometric readings. If a violation of bylaw standards is established, the Bylaw Enforcement Department attempts to encourage reduction of the noise levels, and may press charges. Enforcement of this nature depends on adequate manpower and finances, which in turn is dependent on a political desire to pursue certain standards. McLaren (1979, p. 22) concludes that "municipalities rarely appropriate adequate finances to underwrite enforcement. Consequently, enforcement is either non-existent or left to the grudging initiative of existing agencies, whose time and energy are already stretched to the limit".

Although municipal noise bylaws establish a mechanism to reduce community noise levels, the interest and ability of municipalities to effectively enforce these bylaws is questionable in many cases.

What has been the experience in your community?

NOISE CONSIDERATIONS IN MUNICIPAL AND REGIONAL PLANNING PROCESSES

The basic philosophy of land use planning with respect to noise is to attempt to anticipate and prevent noise related problems. This means that new residential neighbourhoods should be planned so that they are not disturbed by existing noise sources, such as railway yards. Also, new noise producers should be located in areas where their noise will not bother established neighbourhoods. The cost of these measures usually is not high if planning takes place sufficiently early so that no unplanned development takes place (Thiessen and Embleton 1978, p. 52).

In Alberta, the majority of community and regional planning is done by the eight regional planning commissions, by Planning Branch of Alberta Municipal Affairs for the parts of the province not within a regional planning commission, and by the larger municipalities which have their own planning staff, such as Edmonton, Calgary, St. Albert, and Lethbridge. The Planning Act (S.A. 1977, c. 89, s. 66 (1))

requires all municipalities over 1,000 population to pass a land use bylaw and requires that each of the Regional Planning Commissions adopt regional plans (s. 46). These land use bylaws and plans regulate the use and development of land and buildings. Although noise is not specified by the Act as a distinct issue to be addressed by these plans, noise related policies often are implicit in them.

Edmonton Regional Planning Commission (ERPC), for example, adopted an Air Transportation/Land Use Policy (ERPC 1976) which identifies minimizing noise annoyance as a major land use policy issue. The intent of the policy is to ensure that land use planning minimizes noise annoyance through the subdivision approval mandate. ERPC recommends that land use guidelines, prepared by the Federal Ministry of Transport (MOT 1972) and Canada Mortgage and Housing Corporation (CMHC no date), be adhered to by the commission's member municipalities when "assessing the merits of land use proposals (subdivision, rezoning, or development) within NEF contours in the vicinity of airports in the Region" (ERPC 1976, p. 74). The ERPC document (1976, p. 2), however, prominently disclaims the application of the land use policies to the Edmonton Municipal Airport — the airport in the Province with the greatest noise annoyance impact:

> "The Commission recognizes that historical, economic and political decisions have led to the development of this central city airport. Furthermore, because of the established urban land use pattern around this airport, some of the planning controls which are applicable to other airports, where distinct land use planning options exist, are inoperative at this airport. Detailed land use and development controls in the vicinity of this airport are administered by the City of Edmonton. Such controls, as far as is feasible and practical, should nonetheless be administered and developed to be in conformity with or complementary to the regional air transportation/land use objectives and policies."

The question is: To what extent are noise considerations incorporated into the city's planning for the extensive portions of the city within the NEF contours? The CMHC Noise Exposure Forecast map (Figure 1) illustrates that parts of new residential neighbourhoods and several institutions are located within NEF 25, or higher, contours.

If you live in Edmonton, are you disturbed by aircraft noise?

Do you live or work within NEF 25, or higher, contours (see Figure 1)?

Noise related policies implicit in Edmonton's General Municipal Plan and associated planning operations concern only surface transportation noise problems. Edmonton's Transportation Systems Design Department reviews subdivision applications and may identify noise problems requiring attenuation measures to meet their 60 dBA L_{dn} design standard. The standards established by this Department are also incorporated, by the Planning Department, into other planning practices regarding rezoning and development applications.

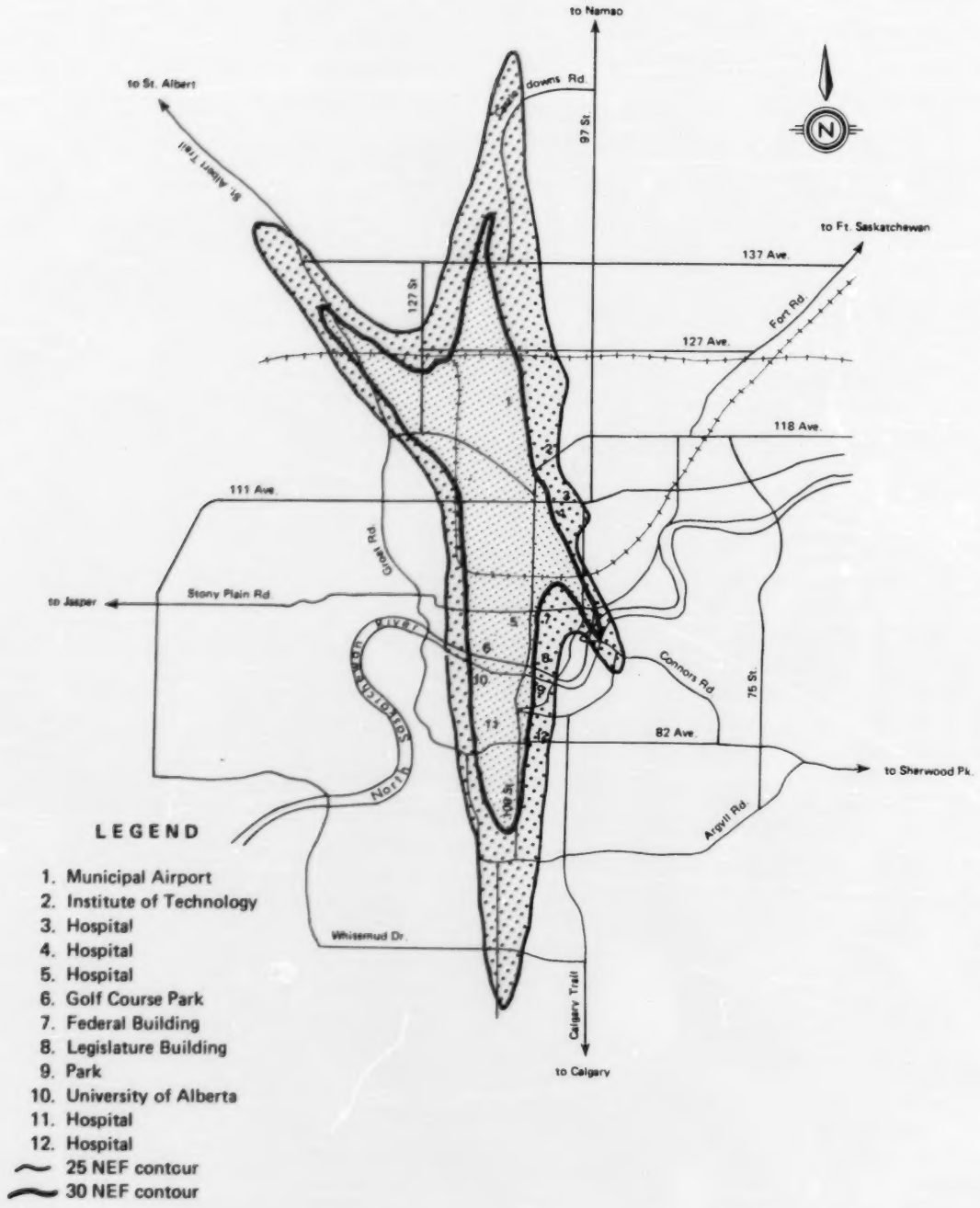

FIGURE 1

The extent to which the 25 and 30 Noise Exposure Forecast (NEF) contours cover the City of Edmonton

Edmonton's Transportation Systems Design Department is also currently promoting development of an urban traffic noise policy for the city. The Department retained the consulting firm of Marshall Macklin Monaghan Ltd. (MMM 1980) to undertake Stage 1 of a study to investigate, among other things, the social, environmental, economic, and health impacts of traffic noise on residential land uses. The study identified that approximately 95,000 persons in Edmonton are exposed to outdoor sound levels ranging between 60 and 75 dBA L_{dn}. Generally, levels in excess of 65 dBA L_{dn} are considered unacceptable. The study investigated the merits of various barrier retrofit programs designed to achieve 65, 60, and 55 dBA L_{dn} levels and concluded that these programs could cost approximately $6 million, $18 million, and $37 million respectively. However, a major restriction of the barrier program is that the effectiveness is generally limited to the ground storey of a building. To protect medium and high density multiple storey dwellings, other measures such as traffic management control, building modification, and air conditioning may have to be used. A policy direction, however, has not been formulated yet.

In Calgary also, noise considerations are implicit in land use planning practices. Special Projects Division of the Planning Department, for example, attempted to ensure adequate planning around the Calgary International Airport prior to provincial enactment, in 1979, of the Calgary International Airport Vicinity Protection Area Regulations (Alta. Reg. 318/79). The Planning Division of the Transportation Department, with jurisdiction over long range planning of transportation facilities, incorporates a 60 dBA L_{dn} design standard into their plans for new facilities and for the upgrading of existing facilities. This division also flags potential noise problems when reviewing development applications. Development proponents, not infrequently, are required to submit a noise impact statement indicating noise attenuation measures to be used in order to achieve the required design standard.

In summary, local noise bylaws, for the most part, simply attempt to control individual noise makers or nuisances. Enforcement of these bylaws may be by police, bylaw enforcement officers, or public health inspectors, all of whom usually have more pressing matters to attend to and may be sensitive to political expediency. Functional limits are also apparent in attempts to integrate noise considerations into land use planning decisions. First, consistency among municipal and regional policies cannot be expected without provincial involvement. Second, land use controls do little to remedy problems associated with existing incompatible developments, the outstanding example being the Edmonton Municipal Airport. In this example, whether the Edmonton General Municipal Plan could develop aircraft noise related policies or not, it has not even acknowledged the problem. Edmonton's rationale that the issue is too politically sensitive suggests that it is not realistic to expect municipal regulation to be able to achieve the comprehensiveness required to adequately address the problem of urban noise. Provincial and federal perspectives are needed.

PROVINCIAL RESPONSIBILITY

A number of departments of the Alberta Government assume responsibility for controlling certain noise problems. Although there is little noise related legislation, various departments have developed special programs and roles in response to noise problems related to other areas of departmental activity.

ENVIRONMENT COUNCIL OF ALBERTA (ECA)

The ECA is an independent Crown Corporation reporting directly to the Provincial Government through the Minister of the Environment. The functions of the Council, as outlined in The Environment Council Act (R.S.A. 1970, c. 125, s. 7 (1) (a) (b) (e), and (i)), stipulate that the Council:

(a) shall conduct continuing review of policies and programs of the Government and government agencies on matters pertaining to environment conservation and shall report thereon to the Minister;

(b) shall, upon being requested to do so by the Minister, investigate any matter pertaining to environment conservation specified in the request and make its report on the matter to the Minister;

(e) shall, upon being requested to do so by an order of the Lieutenant Governor in Council, hold public hearings for the purpose of receiving briefs and submissions on the matter pertaining to environment conservation specified in the order, and shall make its report on the matter to the Lieutenant Governor in Council and the Minister;

(i) through the medium of the Department of the Environment, shall use its best efforts to achieve coordination of policies, programs and administrative procedures of the Government and government agencies relating to matters pertaining to environment.

In the Act, matters pertaining to environment conservation specifically include "the control of noise levels resulting from commercial or industrial operations in so far as they affect the environment in the vicinity of those operations" (s. 3 (c)). Other aspects of noise may be implied from Sections 3 (b), 3 (c), and 3 (f) which simply refer to the preservation, and the prevention and control of pollution of natural resources. The current review of the noise issue in Alberta is based on this authority.

ALBERTA ENVIRONMENT

The Department of the Environment Act (S.A. 1971, c. 24, s. 2(a), (b), (c)) includes in the responsibilites of Alberta Environment "the conservation, management and utilization of natural resources; the prevention and control of pollution of natural resources; and prevention of noise and the control of noise levels resulting from commercial or industrial operations." These responsibilities are very similar to the matters pertaining to the environment which the ECA is directed to review. The Act also provides enabling legislation for the department to make regulations "controlling, restricting or prohibiting any actions of any person for the purpose of abating noise or controlling noise levels" (s. 17 (d)). Although potentially very strong legislation, no regulations have been developed pursuant to this section, and no regulations are anticipated in the foreseeable future.

Alberta Environment responds to noise complaints which find their way to the department. Between 1976 and 1979 the Air Quality Branch, Pollution Control Division received 105 noise complaints. The complaints have included air conditioner noise and generator noise from industry that disturbs residences, noisy apartment air conditioners, blasting, residences being disturbed by truck horn blowing at industrial warehouses, heavy equipment working at night, noisy truck routes, equipment backup warning noise, aircraft noise, and railyard activity noise, to cite a few. Many of the complaints are referred to a more appropriate authority, such as Transport Canada, Alberta Transportation, Energy Resources Conservation Board, the Local Board of Health, and the Airport Control Tower. Where there are no other relevant authorities to investigate a complaint, Alberta Environment, with noise monitoring capability, takes noise level measurements, contacts the offending party, and attempts to negotiate a reasonable solution. The established regulatory roles of department staff responsible for the Clean Air Act (S.A. 1971, c. 16) and Clean Water Act (S.A. 1971, c. 17) are extended to include noise problems. Department staff believe that this consultative approach has been very effective to date, especially in relation to noise generated by industry.

Assessment of noise problems would appear to be included in the mandate of the Land Assembly Division. This branch is responsible for preventing environmental deterioration of thirteen restricted development areas (RDAs) and ensuring environmentally conscious development. The Environmental Assessment Division is responsible for the administration of Environmental Impact Assessment (EIA) reviews. The purpose of the EIA system is to identify and resolve potentially significant adverse environmental effects of proposed resource developments before environmental damage occurs. Noise and vibration are included in a checklist of air parameters to be addressed. Within the Land Conservation and Reclamation Division the Regulated Surface Operations Branch organizes and reviews Development and Reclamation applications. And the Regional Land Use Branch of the same division is part of the subdivision referral system. Major country residential and cottage resort developments, and all proposed subdivisions adjacent to waterbodies, sour gas fields, and industrial sites are reviewed and assessed for potential environmental impacts, of which noise may be one aspect. In practise, however, it appears that noise issues are not considered very often in any of these procedures.

Has your residence or cottage ever been adversely affected by noisy new industrial developments?

ALBERTA TRANSPORTATION

Alberta Transportation has a varied and active role with respect to controlling motor vehicle noise. The Department responds to complaints, receives and reviews subdivision referrals for proposed subdivisions within a half mile of a highway, provides financial assistance for construction of noise attenuation facilities for new road construction, and maintains long range planning and research programs related to highway development.

The department's activities, however, do not appear to be closely related to specific legislation and regulations. The Highway Traffic Act (S.A. 1975, (2), c. 56, s. 35 (1), (2)) specifies equipment and conditions of use of motor vehicles, motorcycles, and bicycles. Section 36, subsections (1) through (6) requires muffling of internal combustion engines, and that the muffler not be tampered with so as to increase noise from the expulsion of gases. Section 45 allows only specified emergency vehicles to use sirens without the authorization of the Minister. Section 104 prohibits stunts which cause loud and unnecessary noise from the motor vehicle. And Section 114 prohibits operating a vehicle on residential streets between 10:00 p.m. and 7:00 a.m. so as to unduly disturb the residents. While Transportation Safety Branch, Construction Division is responsible for the Act, these specific prohibitions are enforced by the RCMP and municipal police. The Act also enables development

of regulations "prescribing warning signals or devices that may be used and the manner of use thereof" (Section 8 (11)). No such regulations have been formulated, however. Similar legislation in the Off-Highway Vehicle Act (S.A. 1972, c. 73, s. 23 (c)) enables development of regulations "prescribing terms and conditions governing the registration, use and operation of the off-highway vehicles" as well as "prescribing any equipment required and the types of uses therefor" (s. 23 (f)). Based on this, the Off-Highway Vehicle Regulations (Alta. Reg. 341/72, s. 11) prohibit operation of an off-highway vehicle if the muffler has been tampered with so as to increase the noise. Enforcement is again a police function with field staff from Forests and Fish and Wildlife, Alberta Energy and Natural Resources also being involved.

The few complaints that Alberta Transportation receives are handled in conjunction with Alberta Environment, or internally by the Operational Design or Construction Branches, Construction Division, or by Transportation Planning and Research Branch, Transportation Planning and Service Division, depending on the specific focus of the complaint.

The Subdivision Regulations (Alta. Reg. 132/78, 6 (1) (f)) pursuant to the Planning Act (S.A. 1977, c. 89, s. 86 (2)) require subdivision applications to be sent to the Deputy Minister (Construction) of Transportation if the land is within 0.5 miles of the right-of-way of a highway. Roadside Development Branch, Construction Division, receives these subdivision applications. Mitigation procedures are frequently required. District Transportation Engineers may also make recommendations regarding subdivisions within 900 feet of secondary roads, subject to local approving authority.

Pursuant to the City Transportation Act (S.A. 1970, c. 47, s. 3) municipalities are responsible for establishing and maintaining transport facilities subject to their direction and management control and are responsible for complying with the terms of this Act. Municipalities may, however, qualify for financial assistance from the Province. The Urban Transportation Branch, Transportation Planning and Services Division administers several programs with financial aid provisions for the development of urban transportation systems and facilities. Under the Arterial Roadway Capital Assistance and Major Continuous Corridors programs, earth berm noise attenuation construction, subject to Alberta Transportation approval, is cost-shareable. The former program is intended to help Alberta's cities develop major arterial roadways which are an extension of, and directly support, the primary highway system leading into and going through the corporate limits. Projects approved under this program are eligible for provincial assistance of 66⅔ percent of approved project costs. The latter program, the Major Continuous Corridors program, applies to the planning and construction of one continuous

primary route of provincial and local importance in each city. Projects approved under this program are eligible for provincial assistance of 90 percent of approved net costs of planning, design, construction, and land acquisition, up to a specified maximum.

Urban Transportation Branch also provides a Research and Development program to promote and financially assist theoretical and/or applied research into the development of effective and efficient urban transportation systems. Projects approved under this program are eligible for provincial assistance of 66⅔ percent of approved project costs which may be increased to 100 percent if the Department considers the project to involve significant multi-jurisdictional concerns, issues, or problems. Noise projects funded under this program to date are the Mayfield Road Experimental Noise Barrier in Edmonton, a scale model for testing wall type noise barriers, and the Alberta Surface Transportation Noise and Attentuation Study, 1977.

And finally, Alberta Transportation not only responds to the occasional noise complaint, but also is actively involved in ensuring that noise considerations are a part of municipal and regional planning processes. A transportation studies program helps small communities in areas experiencing rapid growth, such as Edson and Cold Lake-Grande Centre, to prepare transportation plans to complement general municipal plan preparation.

ALBERTA MUNICIPAL AFFAIRS

Alberta Municipal Affairs incorporates noise considerations into land use planning, such as with the development of special planning areas around airports in the Province. Various other departmental activities also pertain to noise problems from time to time, such as the review of subdivision proposals and the preparation of municipal plans and land use bylaws for communities not included in a Regional Planning Commission.

The Planning Act (S.A. 1977, c. 89, s. 144 (1)) enables regulations to establish special planning areas. Pursant to this, the department has developed Airport Vicinity Protection Area (AVPA General Regulations (Alta. Reg. 291/75), to regulate land use near airports. These have been successfully applied to the Calgary International Airport (Alta. Reg. 318/79), Peace River Airport (Alta. Reg. 267/80), Fairview Airport (Alta. Reg. 287/80), and Barrhead Airport (Alta. Reg. 293/80), and are presently being developed for the Edmonton International, Cold Lake Military, and Red Deer Industrial Airports.

The boundaries of a protection area include all land within the 30, 35, and 40 noise exposure forecast (NEF) contours. The AVPA regulations detail a zoning scheme which permits, conditionally permits, or prohibits land use classes by NEF zone. The AVPA regulations are binding on the authorities having jurisdiction over all or part of the land included in a Protection Area, such as the Regional Planning Commissions, local authority of a municipality, municipal planning commissions, development appeal boards, development officers, Provincial Planning Directors, and the Provincial Planning Board (Alta. Reg. 291/75, s. 14). The AVPA regulations represent an attempt by the Province to apply a consistent policy incorporating noise considerations into land use development decisions. Unfortunately, there is no evidence that such regulations will ever be developed for the Edmonton Municipal Airport.

The Subdivision Regulations (Alta. Reg. 132/78, s. 7 (1) (e)), pursuant to the Planning Act (S.A. 1977, c. 89, s. 141) require subdivision applications to be sent to Municipal Affairs if the land is situated within a special planning area established under the Act. Current Planning Section, Planning Division, reviews referred subdivision proposals, as well as subdivision proposals for the area of the Province not covered by a Regional Planning Commission.

Regional Planning Section, Planning Division, provides long range and general policy planning for the areas not covered by a Regional Planning Commission. While noise is not a major identified issue, it is incorporated into land use planning practice with regard to avoiding land use problems due to noise incompatibility.

Municipal Inspection and Advisory Services Branch, Municipal Administrative Services Division is responsible for administering the Municipal Government Act (R.S.A. 1970, c. 246, s. 157 (1) (g)). This Act enables municipal councils to pass noise abatement bylaws. If a municipality were to request direction with regard to drafting such a noise bylaw, the Branch would probably refer the party to Alberta Transportation and Alberta Environment. No such requests appear to have been directed to the Branch to date, however.

ALBERTA WORKERS' HEALTH, SAFETY AND COMPENSATION

Alberta Workers' Health, Safety and Compensation administers the Provincial Board of Health Regulations Respecting the Protection of Workers from the Effects of Noise (Division 29, Alta. Reg. 30/71). These regulations are currently pursuant to the Public Health Act (R.S.A. 1970, c. 294). New legislation, however, is being prepared to transfer this responsibility to the Occupational Health and Safety Act (S.A. 1976, c. 40). The regulations (Division 29) stipulate permissible noise expo-

sure levels by duration of various sound levels. Where a person is required to work in noisy areas exceeding the regulations, the employer is required to take appropriate measures to suppress noise exposure to the specified levels. If it is not reasonably practicable to decrease the noise or isolate the worker from the noise, the worker must be supplied with, and must wear, personal protection equipment (ear plugs or headphones) which will effectively attenuate the noise to acceptable levels (s. 29-2-3 (1)). The personal protective equipment must be supplied at the employer's expense (s. 29-2-3 (2)). The regulations further specify that any establishment in which high noise levels are shown to exist is required to set up hearing conservation programs. All employees must comply with the programs (s. 29-2-4). Any establishment in which high noise levels are suspected shall be open to inspection at any time within the normal working day (s. 29-3-1).

Division 29 regulations are administered by the Medical Services and Occupational Hygiene Branches, Occupational Health and Safety Division. Responding primarily to requests from employers and unions regarding noisy work environments, Occupational Hygiene Branch measures noise levels and establishes whether a noise problem exists with respect to the regulations. If the noise levels exceed permissible criteria, the Branch attempts to persuade the employer to improve conditions. Offending employers, bearing full cost, frequently hire consultants to study the noise problem and provide solutions. Medical Services Branch focuses on the workers rather than the work environment. This branch promotes occupational hearing conservation programs. These programs include audiometric testing of worker hearing abilities, monitoring the effectiveness of hearing protection equipment, worker education, posting notices of work areas hazardous to hearing, and developing administrative controls with employers.

The department's Research and Education Branch, Occupational Health and Safety Division, has an active farm safety program which includes heightening awareness of noise hazards on the farm. For example, as part of the department's agricultural fair displays, a pilot study to audiometrically test farmer hearing loss was initiated in 1979. Alberta Agriculture provided the funding for this program. The testing was carried out in Ponoka and Stettler and a high level of interest among farmers was reported. It appears that farmers are becoming increasingly aware of hearing impairment resulting from farm activities. Research and Education Branch's involvement with noise also includes noise related publications and training programs that focus on preventing noise in the workplace.

Also within the department, the Workers' Compensation Board (WCB) provides compensation for hearing loss and impairment suffered by workers covered by their benefits. The Board averages 75 to 100 long term exposure hearing loss claims a year as well as many short term hearing problems which require medical aid and restitution for loss of time.

Alberta Workers' Health, Safety and Compensation, responsible for noise in the workplace, faces considerable challenge in encouraging workers to wear adequate hearing protection. General resistance to hearing conservation programs is usually couched in arguments that workplace noise is not the only influence affecting hearing impairment. Hearing conservation programs are often severely hampered by high employee turnover in noisy environments. Jurisdictional conflicts also occasionally arise, for example, with respect to working conditions in airline companies, an area, apparently, of federal responsibility.

Are noise levels high in your workplace?

ALBERTA SOCIAL SERVICES AND COMMUNITY HEALTH

The Public Health Act (R.S.A. 1970, c. 294) provides the enabling legislation for the Provincial Board of Health Regulations Respecting Nuisances and General Sanitation (Division 34, Alta. Reg. 95/73). These are general regulations prohibiting the creation or maintenance of any nuisance (s. 34-3-1). A nuisance is defined as any condition "that might become injurious or dangerous to health" (s. 34-1-1 (b)), which may include noise problems. The regulations delegate the responsibility of investigating a nuisance complaint to an executive officer of the Local Board of Health. If the investigation reveals nuisance conditions, the officer may serve written notice ordering the offender to abate the nuisance within a specified time period. If the nuisance is not abated the officer may initiate prosecution, pursuant to Section 50 of the Public Health Act, for refusal to carry out an order. Although there appears to be authority to control some noise problems in this manner, it is believed that it never has been applied.

The Department, however, does have several noise related functions. Speech Pathology and Audiology Section, Health Services, is currently undertaking a speech and audiology screening program in the schools to identify speech and hearing problems. Noise, however, is not necessarily the cause of such hearing problems. And Preventative Social Services (PSS) reviews draft regional plans and numerous physical planning issues at the municipal level. Among the many concerns they raise is the impact of community noise levels with regard to preventing the "emergence of costly social problems" (Hannis, 1980, p. 5). There is potential for PSS to provide effective input into planning processes with regard to community noise problems, though in practice, to date, it rarely happens. Finally, Environmental Health Services, Community Health, occasionally receives subdivision referrals. Their recommendations may include noise related considerations.

ALBERTA LABOUR

The Alberta Uniform Building Standards Act (S.A. 1973, c. 85) controls the design and construction of buildings. The current Alberta Building Regulations (Alta. Reg. 149/78) are pursuant to Section 3 of the Act. The sound control section (s. 9.11) of the Building Regulations regulates residential acoustical ratings in multifamily dwellings. The regulations require constructions to provide a sound transmission (airborne sound) class (STC) rating of not less than 45 between dwelling units in the same building as well as between service rooms (such as laundry, workshop, or garage) serving more than one dwelling unit, and the dwelling units (ss. 5.9.11.2.1 and 9.11.2.2). Building Standards Branch, General Safety Services Division administers these regulations.

In reviewing these regulations, Li (1979, p. 87) comments that "current information indicates that this value (STC 45) is generally too low and that the requirements should be spelled out in more detail". He feels that there is "a need to upgrade the existing Canadian requirements, especially in sensitive areas such as bedrooms, living rooms, and multidwelling buildings" (Li 1979, p. 87). His report recommends specific changes in the Alberta Building Regulations with respect to airborne sound insulation, impact sound insulation, and noise from mechanical appliances and building services.

Alberta Labour receives occasional noise related complaints, most frequently with regard to apartment building noise problems. Although the building regulations require an STC rating of not less than 45 between dwelling units in the same building, many walkup apartments do not meet this standard. Excessive noise levels in residential buildings may be due to noncompliance with the regulations.

When planning a move, do you find out whether the noise insulation qualities of prospective houses or apartments are adequate?

ENERGY RESOURCES CONSERVATION BOARD (ERCB)

The ERCB, pursuant to authority under the Energy Resources Conservation Act (S.A. 1971, c. 30, s. 2) developed Interim Directive 73-1 in 1973 to establish "maximum permissible noise levels applicable to energy resource industry operations, in particular, drilling rigs, compressor stations, pumping stations, and gas well flaring" (ERCB 1980). Recently refined slightly, ID 80-2, as it is now called, stipulates that noise level readings shall be taken fifteen metres from any occupied permanent dwelling. The maximum permissible noise levels are 65 dBA daytime and 50 dBA nighttime. Enforcement of the guidelines is tied in with the licensing

and inspection activities of the Board. Specific noise problems are investigated in response to complaints and generally are satisfactorily resolved by cooperative negotiations.

Reviewing the guidelines, Bolstad (1977) indicates a number of shortcomings. From field studies, Bolstad has found that dominant atmospheric sounds in rural Alberta are commonly 25 to 35 dBA. Industrial sound levels of 50 dBA, which comply with ERCB guidelines, are dominant and disturbing. It would appear that this failure to provide relevant rural guidelines is a serious inadequacy. Bolstad also points out that because the measurements are taken from existing occupied permanent dwellings, there is no provision for the problem of new residences encroaching on an existing industry (Bolstad 1977, p. 47). A possible solution to this last point may be found in developing companion legislation, as has been done for sour gas developments. Subdivision regulations could restrict proposed residential development in potential problem areas.

OTHER PROVINCIAL DEPARTMENTS

Alberta Agriculture is funding part of Alberta Workers' Health, Safety and Compensation's farm safety program. This program involves a mobile audiometric testing facility set up at several agricultural fairs to sample hearing abilities of farmers. Results so far suggest that hearing impairment is a serious problem among farmers. Alberta Agriculture, through the regional Home Economists and District Agriculturalists, is attempting to heighten awareness of noise problems and the need for hearing protection among the farm community. And the Farmer's Advocate, the department's ombudsman, receives and responds to occasional noise related complaints. Most of these complaints involve the effects of compressor station and construction noise on the dairy and poultry industry. Successful resolutions are achieved either by compensation or operation changes.

If you work in agriculture, are you aware of any noise problems? Are you taking precautions to protect your hearing?

Alberta Energy and Natural Resources administers all public lands in the Province and is responsible for integrated resource planning and policy development. Public Lands Disposition Branch, Public Lands Division, for example, is responsible for issuing dispositions of public land for agricultural, commercial, industrial, residential, and recreational purposes. Operational conditions on land disposition may be imposed to minimize conflicts with other uses or adjacent landowners. The Land Management and Development Branch, Public Lands Division, is responsible for the operational level planning including the development of residential and indust-

rial subdivisions on Crown Lands. And the Resource Planning Branch, Resource Evaluation and Planning Division, coordinates and prepares integrated natural resource plans. Detailed land management plans are prepared for specific areas indicating which uses should occur and specifically where. The Branch also reviews draft plans prepared by other departments and agencies. Conflicts between noise generators and noise sensitive uses may be created or prevented by many of the decisions made within these processes.

Also, within Alberta Energy and Natural Resources, both the Forest Service and the Fish and Wildlife Division assume some noise control responsibility. Under the Forests Act (S.A. 1971, c. 37) the Forest Land Use Zone, Forest Regulation Area and Forest Recreation Trail Regulations (Alta. Reg. 343/79) regulate the operation of off-highway vehicles within specific recreational use areas. The Alberta Forest Service, which administers these regulations, attempts to prevent public disturbance near campgrounds as well as to protect sensitive sites from physical damage. The Fish and Wildlife Division occasionally requests the Alberta Forest Service to curtail timber harvesting during certain seasons (such as during calving) to avoid wildlife disturbance. The Fish and Wildlife Division also administers game regulations, pursuant to the Wildlife Act (R.S.A. 1970, c. 391), which include prohibitions designed, at least in part, to minimize public disturbance from noise. For example, Sunday hunting is prohibited in the settled areas of the Province.

Alberta Recreation and Parks attempts to limit the effects of noise on wildlife and other park users. Disturbances usually are handled by the park officers with RCMP cooperation, if necessary. Constructive warnings generally work very well. Concern for the impact of noise on wildlife, however, frequently raises jurisdictional problems. Control of the use of jet boats disturbing trumpeter swans in Saskatoon Island Provincial Park, for example, involves agencies at several levels of government; Canada Wildlife Service, Fish and Wildlife Division of Alberta Energy and Natural Resources, Parks Division of Alberta Recreation and Parks, and the RCMP, to name just a few obvious agencies.

Alberta Consumer and Corporate Affairs receives occasional consumer complaints about noisy products. The complaints are simply referred to the federal department of Consumer and Corporate Affairs.

Alberta Government Services (AGS), responsible for maintenance of government buildings, receives about half a dozen complaints a year primarily with regard to equipment noise problems in government offices. The problems are handled by the department's own architectural and technical staff who attempt to maintain a design standard of 48 dBA within government buildings.

Alberta Housing and Public Works considers various aspects of acoustics in provincial government buildings from a design point of view. Professional Services Division provides architectural advice regarding building acoustics and noise control.

The major involvements of *Alberta Advanced Education and Manpower* and *Alberta Education* with noise problems, concern siting of institutions and achieving quiet interiors. Specific noise problems, such as high levels in certain woodworking shops at the Northern Alberta Institute of Technology, for example, are referred to Alberta Government Services. Colleges and Universities with their own Board of Governors, and local school boards, are responsible for maintaining their own buildings.

Finally, *Alberta Economic Development* and *Alberta Tourism and Small Business* have indirect involvements with noise problems. The Process Industries and General Industries Branches, Development and Trade Division, Alberta Economic Development, are responsible for the development of strategies for the enhancement and expansion of the industrial sector and opportunities in domestic and international markets. And Alberta Tourism and Small Business is responsible for the development and management of programs designed to stimulate the balanced growth, productivity, and diversification of small businesses and the tourist industry. Such programs have implications regarding potential industrial noise problems throughout Alberta.

SUMMARY OF PROVINCIAL RESPONSIBILITIES

Although at least eighteen provincial departments and agencies have administrative and regulatory interests in noise problems, it would appear that noise is not regarded as a high priorty provincial issue requiring expeditious or comprehensive attention.

There are only two significant provincial noise regulations. First, the Board of Health regulations respecting the protection of workers from the effects of noise (Division 29, Alta. Reg. 30/71) set slightly more stringent permissible maximum noise exposure levels than the federal Canada Labour Code regulation (S.O.R./71-584). Alberta Worker's Health, Safety and Compensation administers the Division 29 regulations through audiometric and workplace environment testing programs, as well as hearing conservation programs. Second, the Airport Vicinity Protection Area regulations (Alta. Reg. 291/75, 318/79, 267/80, 287/80, and 293/80), being developed by Alberta Municipal Affairs for all major airports in Alberta, represent an attempt at the provincial level to formulate and apply a consistent

noise related policy. This policy is implemented by mandatory incorporation of AVPA regulations (when adopted) into official regional and municipal planning documents.

The remaining provincial legislative provisions are of limited significance. Although the Department of the Environment Act gives Alberta Environment the authority to address broad aspects of environmental noise, no regulations have been adopted pursuant to this Act. The department performs a trouble-shooting role in response to specific complaints which find their way to the department. Although the Municipal Act enables municipal governments to adopt noise related bylaws the effectiveness of such bylaws is discussed and questioned in the previous chapter. The Alberta Building Regulations stipulate sound transmission class ratings but are subject to criticism for not being comprehensive. Provincial motor vehicle provisions merely specify several aspects of motor vehicle equipment and use, such as condition of mufflers and the prohibition of loud stunts. These provisions are enforced by the police and have little relevance to Alberta Transportation activities. Finally, the ERCB noise guidelines are simply an interim measure to deal with energy resource industry noise problems pending more comprehensive legislation. However, more comprehensive legislation is not contemplated.

A number of provincial departments, however, receive at least the occasional complaint about specific noise problems. Their approach is to either refer the complainant to a more appropriate authority, or investigate the problem themselves and attempt to negotiate and develop a satisfactory resolution. According to Alberta Environment, Alberta Transportation, and the ERCB, who follow up on the majority of such complaints, this consultative approach is successful in almost all cases. The lack, however, of coordination of noise complaints suggests that most noise related problems never reach a department that can do anything about them. Alberta Consumer and Corporate Affairs, for example, has no responsibility for appliance noise. It is unclear where complaints about noisy lawnmowers, power tools, or household appliances should be directed.

Have you ever attempted to lodge a noise complaint?
Was the response satisfactory?

Several departments incorporate noise considerations into various aspects of daily activities. Alberta Environment, Alberta Transportation, the ERCB, and Alberta Workers' Health, Safety and Compensation all make occasional recommendations with regard to noise problems. The inclusion of noise considerations in this way, however, is informal and depends greatly on the individual officials reviewing any one project.

A few provincial departments have special programs related to noise. Alberta Transportation's extensive research and cost-sharing programs, with respect to surface transportation noise attenuation, are breaking new ground. Similarly, the farm safety program being carried out jointly by Alberta Workers' Health, Safety, and Compensation and Alberta Agriculture is attempting to heighten awareness of noise hazards on the farm.

Finally, an increasing educational role is anticipated by several departments. Alberta Agriculture, for example, notes an increasing awareness on the part of the regional Home Economists and District Agturalists of noise related problems, as well as an interest on their part to distribute hearing protection information. Similarly, Alberta Workers' Health, Safety and Compensation, Alberta Education, and Alberta Advanced Education and Manpower anticipate greater involvement in education programs dealing with noise.

Have you had personal experience with any provincial programs related to noise problems?

Do you consider the program(s) effective?

How can the provincial role be strengthened?

FEDERAL RESPONSIBILITY

Although there are only a few provisions in federal legislation which make reference to the control of noise, several federal programs are making important contributions to the field of noise control.

TRANSPORT CANADA AND THE CANADIAN TRANSPORT COMMISSION (CTC)

The Federal Government, pursuant to the BNA Act (1867 s. 92 (10) (a)), has responsibility for interprovincial transport systems and specific modes of transportation, such as air transport and shipping. Transport Canada and the Canadian Transport Commission (CTC) share responsibility for policy development and regulation of federal transportation interests. The National Transportation Act (1970, c. N-17), designed to "define and implement a national transportation policy for Canada", applies to railways, air transport, water transport, and interprovincial commodity pipelines and transport for hire (s. 4). Air, rail, and motor vehicle transportation also have their own more specific Acts.

Air Transportation

Federal involvement with aircraft and airport related noise problems pertains to the operation of airports and airlines, and the use of federal land adjacent to airports.

Pursuant to the Aeronautics Act (R.S.C. 1970, c. A-3, s. 6(1)) the Minister of Transport may develop noise abatement procedures with respect to the operation of aircraft. Governing such matters as power controls, climb and approach angles, and flight paths, operating procedures are issued by the Department in the monthly publication, Canada Air Pilot. A pilot in violation of these procedures may have his licence cancelled or suspended and would be guilty of an offense under the Aeronautics Act (s. 815 (a), (d)) (McNairn 1972, p. 270).

Planning Division, Department of Transport provides the necessary data and computations for the development of noise exposure forecast (NEF) contours around most airports. CMHC then develops the information into official maps. CMHC may deny financing to discourage inappropriate land uses in high noise exposure areas. The NEF information in Alberta is also incorporated into provincial Airport Vicinity Protection Area regulations which are incorporated into regional and municipal land use plans and regulations.

Although the United States, through the Federal Aviation Authority, has a formal certification program for achieving quieter aircraft engines, Canada has no such program. However, because most new aircraft are manufactured in the United States, Canadians benefit from American regulations. There is some indication that noise reduction conditions may be tied to licensing of new aircraft in Canada in the future (McLaren 1979, p. 26).

In an ongoing research context, the Edmonton Civil Aviation Division, Transport Canada, has an urban noise monitoring program. The intent is to provide base data on noise levels, especially in urban areas where aircraft noise is particularly troublesome. It is anticipated that specific programs may be developed in the future to help alleviate the noise problems.

Motor Vehicle Transportation

The Motor Vehicle Safety Act (R.S.C. 1970 [1st supp.] c. 26) enables formulation of regulations respecting the use of national safety marks for vehicles imported into or exported from Canada, or conveyed from one province to another. Pursuant to the Act, current Canadian Motor Vehicle Safety Regulations (S.O.R./79-115) establish maximum exterior noise levels of 83 dBA for heavy duty trucks and buses, 80 dBA for light vehicles, 86 dBA for motorcyles, as measured in a driveby test at 15 meters from the source, and 78 dBA for snowmobiles (S.O.R./75-255).

The Road and Motor Vehicle Traffic Safety Branch, through its compliance officers, ensures that manufacturers of all new vehicles meet the requirements of the standards for product certification. A limitation of the regulations is that they do not extend to "after sale" products such as replacement mufflers. Although it is expected that future revisions will aim at gradual reduction of the permissible maximum sound levels, the department's policy simply appears to be a following of EPA standards on an ad hoc basis. In fact, concern is expressed regarding the lack of a rationale for noise standards. The Road and Motor Vehicle Traffic Safety Branch's limited research program is being phased out by March 1981. The research program has been attempting to address basic issues such as how far it is necessary to go with vehicle noise regulations, how to develop a systematic

measure of noise exposure impact, and how to evaluate the cost effectiveness of alternative noise control approaches. Although the recent parliamentary committee on regulatory reform endorsed the existing Treasury Board policy requiring a thorough socio-economic impact analysis rationale for all safety regulations, such policy appears empty in this context.

The Road and Motor Vehicle Traffic Safety Branch, from a practical point of view, however, is attempting to encourage greater consistency in provincial and municipal regulations. The Branch provides planning information on future vehicle and traffic noise levels requested by various provincial and municipal sources, including most recently the City of Edmonton's Transportation Systems Department. The Branch also helps to develop CSA standards that are as simple as possible. The hope is that provincial and local governments will use the motor vehicle noise measurement standards, for example, in developing regulations complementary to federal standards. If greater noise attenuation is to be achieved, however, permissible maximum levels have to be enforced beyond the manufacturer to include operational and maintenance conditions, areas apparently beyond federal jurisdiction.

Do you believe that attention should be focused on making new cars, trucks, buses, motorcycles, and snowmobiles quieter?

Rail Transportation

The Railway Act (R.S.C. 1970, c. R-2) provides for the regulation of interprovincial railways in Canada. The CTC and Minister of Transport are granted broad powers and specific duties in controlling and regulating railroads (DeLeuw Cather 1977, p. A-2). The Railway Act (s. 227 (1) (a) (b) and (l)) empowers the CTC to regulate the speed of trains, the use of a whistle within a city, town, or village, and to provide for the protection of the public and the employees. The Freight Development Branch, Department of Transport, is involved with a research program studying the development of noise exposure forecast (NEF) contours for areas adjacent to railways, as has already been developed for airport vicinities. Although still at a technical stage, the project suggests that the Department will attempt to encourage complementary provincial, regional, and local land use planning procedures for areas of high railway noise exposure.

ENVIRONMENT CANADA

Environment Canada's Policy Coordination and Development Branch of the Policy, Planning and Assessment Directorate has given consideration to the need to establish a federal noise pollution control program. The Branch identified the fact that urban, rural, and wilderness areas of Canada are being affected by noise pollution. It was acknowledged that provinces and municipalities, because of their limited jurisdiction, cannot address noise pollution comprehensively. The Branch suggested that solutions to noise pollution should involve all these levels of government, as well as industry, with leadership most appropriately asssumed by Environment Canada. Such a coordinating role would involve: a) development of a national program; b) collection and dissemination of information; c) provision of technical expertise in the field of noise level and exposure evaluation and control; and d) development of guidelines, regulations, and codes of good practice as required. However, in 1977, financial and manpower resources for new programs were severely restricted and efforts to establish a federal noise pollution control program had to be abandoned.

Environment Canada's current involvement with noise pollution is limited to the occasional inclusion of noise as an issue in the Environmental Assessment and Review Process (EARP). EARP provides for the possible review of all federally related projects and activities with regard to environmental impact. Noise is one of many environmental factors. In the *Guide for Environmental Screening* (Environment Canada 1978, pp. 23, 24, 35) noise is explicitly identified in relation to demolition of buildings, construction of erosion controls, energy generation projects, and automobile, aircraft, and vessel movements. However, the noise factor rarely emerges in the vast majority of reviews. And the EARP policy in general is open to serious criticism. EARP uses the self assessment approach, EARP lacks related legislation, and the EARP review process often is not implemented until after many commitments have been made and projects started (McLaren 1979, p. 28).

LABOUR CANADA, HEALTH AND WELFARE CANADA, AND THE TREASURY BOARD

There are two sets of federal occupational noise provisions. First, Labour Canada administers noise control regulations (S.O.R./71-584) pursuant to the Canada Labour Code (CLC) (R.S.C. 1970, c. L-1, s. 84). These regulations specify a maximum noise exposure limit of 90 dBA per eight hour day for employees working within federal jurisdiction, such as radio and television broadcasting corporations and Crown Corporations. Second, the Treasury Board, as an employer, is responsible for the health and safety of all federal employees. The Treasury Board's noise control and hearing conservation standard guidelines (1972) are very similar to the CLC regulations.

Occupational Safety and Health Branch, Labour Canada, has inspectors to administer the CLC regulations. The inspectors respond to complaints about specific noise problems. Labour Canada also provides noise monitoring capability for federal departments to determine compliance with the Treasury Board guidelines.

Health and Welfare Canada carries out environmental health surveys, periodic health examinations, and frequent audiogram testing of federal employees in areas suspected of hazardous noise levels. Health and Welfare Canada also has an active research program looking at establishment of better health criteria for regulating noise problems.

CONSUMER AND CORPORATE AFFAIRS CANADA

The Hazardous Products Act (R.S.C. 1970, c. H-3), reflecting federal interests in product safety, contains no explicit reference to noisy products (McLaren 1979, p. 27). Pursuant to Section 8 (1) (b), however, which allows for the prohibition of products that are a "danger to the health and safety of the public because of its design, construction or contents", one noise-related regulation exists. It bans toys which make noise exceeding 100 dBA measured at the distance that the product ordinarily would be from the ear of the child using it (S.O.R./70-482). The onus is on the manufacturers to meet all the health and safety regulations, failure to do so being a criminal act. Product Safety Branch has inspectors who respond to complaints. These inspectors also carry out routine examinations and spot checks of consumer products to ensure compliance with the regulations. The Department, however, appears to have no interests in regulating noise levels of any other consumer products.

What appliances, tools, or toys in your home do you consider to be too noisy?

NATIONAL RESEARCH COUNCIL CANADA (NRCC)

The National Research Council has an active interest in many aspects of noise and its control in Canada. From a quasi-regulatory viewpoint, the Codes and Standards Branch, Research Division, in conjunction with the Associate Committee of the National Building Code, writes and publishes the National Building Code. Section 9.11 of the Code provides for sound controls. Two subsections have been developed to date. Subsection 9.11.1 references the American Society for Testing and Materials (ASTM) standard E90-75 which specifies the standard method for laboratory measurement of airborne-sound transmission loss of building partitions. And Subsection 9.11.2 specifies required airborne-sound control locations. The National Building Code, however, is strictly an advisory document. It gains legal significance only when adopted by provincial or local regulations.

From a research point of view, the Acoustic Section, Physics Division of NRCC has an outstanding international reputation for their expertise in both pure and applied noise related research. Research topics may result from specific requests from other government departments and agencies, corporations, or even private individuals raising unusual problems with important scientific implications. The Section also conducts internally generated research programs which provide significant long term direction. For example, within the last 5 years NRCC's group of experts has broken new ground with regard to measuring how sound is propagated out of doors. NRCC scientists frequently publish in scientific journals making significant contributions to the state of the art. NRCC's noise experts are important international practitioners in the field of acoustics.

Somewhat ironically, NRCC research does not appear to have a great deal of direct influence on Canadian policy or practice. While CSA technical committees have utilized NRCC research, such as NRCC's work on outdoor sound propagation as it related to developing measurement procedure for heavy duty trucks (CSA Standard Z107.22M), most departments, such as Transport Canada, depend on SAE and ISO/ECE standards for developing new Canadian standards. Although this is consistent with the Canadian objectives of international harmonization of standards, there is a regrettable lack of technical resources to support vigorous Canadian participation in international standards organizations. The NRCC, in reality, often has its main influence on Canadian regulations indirectly, through American technical and professional associations.

Although research as carried out by the NRCC is expensive, it is potentially invaluable, for example, to Canadian secondary industries which cannot afford to follow someone else's lead if they are to be successful on the international market. To illustrate this, Canadian chain saw and snowmobile industries have been hard pressed to compete with Swedish and German firms which, recognizing environmental and health concerns, were the first to develop quieter products. In the long term, research programs, such as those carried out by NRCC, help to stimulate greater innovation throughout many sectors of the Canadian economy.

CANADA MORTAGE AND HOUSING CORPORATION (CMHC)

Canada Mortgage and Housing Corporation's (CMHC) involvement with noise problems is related to quality of housing conditions as encouraged by CMHC's financial support (CMHC no date, p. 5). Pursuant to the National Housing Act (R.S.C. 1970, c. N-10) the Corporation offers mortgage financing and insurance. However, CMHC financing may be denied for failure to satisfy specific policy requirements with regard to housing near airports, or housing adversely affected by noise from roads and railways (CMHC no date, p. 5; CMHC 1977, p. 1). "As a matter of general policy the Corporation wishes . . . to discourage the construction of new residential development on sites subject to high noise exposure and to introduce sound insulation in residential development on sites subject to some noise exposure at a lower level" (CMHC no date, p. 5). Not only are the guidelines directed toward the developer, but CMHC hopes that "all levels of government will take these criteria into consideration when preparing comprehensive land use plans" (CMHC 1977, p. 1).

Prior to early 1980, the road/rail/air guidelines were mandatory with regard to all CMHC financing, and remain mandatory for publicly financed housing. However, the guidelines now are simply advisory for projects which approach CMHC on the free market. In general, the guidelines aid CMHC's review of developments with potential noise problems by providing specifications for various mitigative measures.

CANADIAN STANDARDS WRITING

The Standards Council of Canada (SCC), a Federal Crown Corporation which reports to Parliament through the Minister of Industry, Trade and Commerce, has indirect noise control interests. The existence of adequate measurement standards is a key element in the development of effective noise control regulations and their enforcement. Standardization specifies what is meant by the numbers, units of measurement, and methods and conditions of measurement referred to in the regulations. A standard is a technical document which defines specific requirements of a measuring device or technique. Standards are usually written by skilled volunteers affiliated with one of the SCC's accredited standards writing bodies.

The Canadian Standards Association (CSA) has accreditation for writing standards in the area of acoustics and noise. Standards, once written, are reviewed by SCC to ensure that standards writing criteria are met. Specific standards only become mandatory if referred to in a regulation or contract.

The CSA has a committee working on acoustics and noise control whose focus is to meet the need for standards with respect to:

1. measurement methods and instrumentation;
2. noise from powered equipment;
3. noise from transport vehichles;
4. industry noise;
5. noise from small appliances;
6. sound transmission through buildings;
7. and hearing measurement (Toole 1979, p. 49).

Such a committee, whose membership includes representatives from industry, universities, various government levels and departments, and consumer organizations, has considerable potential with regard to influencing greater coordination of noise control policies. Well developed and timely standards ideally encourage a nationally consistent approach to noise control regulations among all levels of government. Such an approach helps to ensure that suppliers of merchandise and services are not forced to cater to arbitrarily different requirements in different regions or municipalities (Toole 1979, p. 45). To date, however, there are only a few current CSA acoustical standards.

THE CRIMINAL CODE

The Federal Government also expresses responsibility for noise through the Criminal Code. In fact, the only federal statute which makes explicit provisions for controlling noise is the Criminal Code (R.S.C. 1970, c. C-34, s. 171). It states that anyone in or near a public place who "disturbs the peace and quiet of the occupants of a dwelling-house by discharging firearms or by other disorderly conduct in a public place is guilty of an offence punishable on summary conviction." Section 176, dealing with common nuisances, identifies as an indictable offence an act, or failure to discharge a legal duty, which results in endangering the lives, safety, health, or comfort of the public (s. 176 (1) (a), (2) (a)). Enforcement is based on complaint, with the onus on the complainant to provide the police with evidence that safety, health, or comfort have been endangered by a specific noise source. Representatives of the Crown have not shown enthusiasm for proceeding under this section (McLaren 1979, p. 24).

SUMMARY OF FEDERAL RESPONSIBILITIES

At least ten federal departments and agencies are involved with researching and/or controlling noise problems. Although the legislated provisions regarding noise are limited and fragmented, several of the research programs are of substantial significance.

There are only three sets of noise-related federal regulations. The most current are the Motor Vehicle Safety Regulations (S.O.R./79-115 and S.O.R./75-255) which restrict noise emissions of new trucks, cars, motorcycles, and snowmobiles. These regulations are receiving constant attention and are expected to be gradually revised downward. The Canada Labour Code Noise Control Regulations (S.O.R./71-584), providing protection for employees within federal works' jurisdiction, lag behind occupational noise regulations in Alberta which followed the lead of the United States. And the Hazardous Products (Toys) Regulations (S.O.R./70-482) ban excessively noisy toys. There is no apparent rationale, however, for the 100 dBA level, or, why numerous other excessively loud consumer goods are not regulated.

The remaining legislated federal provisions related to noise stipulate aircraft operation procedures pursuant to the Aeronautics Act, railway operating procedures pursuant to the Railway Act, and prohibition of disturbing the peace pursuant to the Criminal Code. Only the first procedures are revised frequently with noise considerations in mind.

There are also three noise related federal policies. The Treasury Board's noise control and hearing conservation policy providing hearing protection for federal public employees is modelled on the CLC regulations. The CMHC's air/road/rail guidelines, with respect to providing financing for new housing in noisy areas, are primarily advisory. And the National Research Council's national building code is also just an advisory document to be adapted and adopted as desired by provincial and municipal authorities.

A number of federal research programs, however, are impressive. The Edmonton Civil Aviation Division of the Department of Transport is developing an urban noise monitoring program that is expected to provide a data base for further research into community noise problems. And the Freight Development Branch of the same department is initiating a research program to investigate the development of NEF contours for areas exposed to rail noise. Both programs are intriguing and of potential significance with regard to developing more comprehensive policies and regulations, but are questionable at this stage with regard to their longevity and status within departmental policies. With this in mind, the fate of the Road and Motor Vehicle Safety Branch's research program focusing on developing an under-

lying rationale for the department's noise regulations cannot be ignored. Health and Welfare Canada and the National Research Council have well respected research programs related to noise. Health and Welfare's program focuses on the establishment of specific health criteria to be used in the development of noise regulations. The department is equipped with a noise lab and publishes its findings. Similarly, the Acoustic Section of the NRCC has been publishing noise related research for well over twenty years and is staffed by experts with international reputations. NRCC, in fact, has published several papers regarding the legislative control of noise and is explicitly concerned about the integration of research into a more comprehensive approach to noise regulations.

What is your opinion of the involvement of the Federal Government with noise problems?

INTERNATIONAL CONSIDERATIONS

From a wider international perspective it is interesting to note that noise is an increasingly important issue around the world. Among the twenty-four countries affiliated with the Organization for Economic Cooperation and Development (OECD), for example, the problems of noise pollution have become so great that the organization held the world's first international conference on Noise Abatement Policies in Paris, 7-9 May 1980. Emphasizing the need for strengthened international cooperation, the conference considered such noise control strategies as legislation, economic instruments (charges, compensation), community action, and several low-cost techniques including information, education, acoustic labelling, and experiments with "quiet towns" (MacNeill 1980, p. 38).

Identifying motor vehicles as the major cause of increasing noise pollution, the conference stressed the need for concerted effort aimed at reducing transportation noise. The graph (Figure 2) of motor vehicle noise limits and targets for a number of OECD member countries representing Canada's major trading partners, demonstrates quite a range in existing legislation, although it must be noted that in Europe measurements are made at one half of the distance they are made in North America. A dramatic difference is evident when present (future unknown) federal provisions are compared with municipal provisions affecting motor vehicle noise limits in Alberta. Although the Canadian Motor Vehicle Safety Regulations (S.O.R./79-115) respecting noise levels at time of import are reasonably close to present international levels, the operational provisions within the Calgary and Edmonton bylaws are much less stringent. Within the heavy lorries category, for example, regarded equivalent to Calgary's tractor trailer category and Edmonton's diesel powered motor vehicle category, Alberta's permissible limits range from 92 to 98 dBA as opposed to the international maximum of 91 dBA. In this context, not only are the motor vehicle sections of the municipal bylaws questionable in terms of enforceability, but also regarding the utility of such high permissible levels.

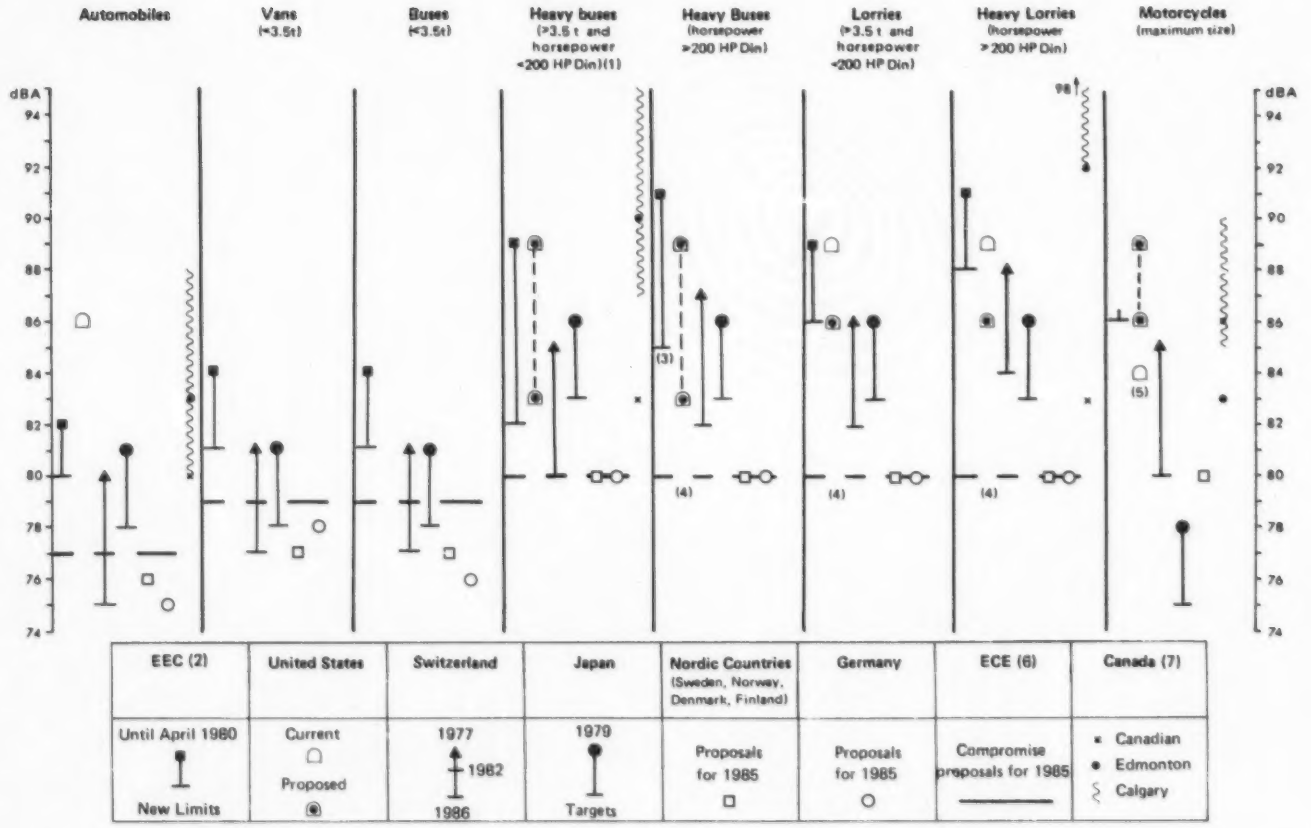

FIGURE 2

Motor vehicle noise limits and targets for selected OECD countries compared with current Canadian, Edmonton, and Calgary limits (Figure adapted from MacNeil 1980:40) (8)

1) Deutsche Industrie Normen. 2) EEC limits allow 1 dBA tolerance. 3) Applicable from 1982. 4) Applicable after 1985. 5) California only. 6) The UN's Economic Commission for Europe. 7) Canadian motor vehicle noise limits specified by: Canadian Motor Vehicle Safety Regulations (S.O.R./79-115); Calgary By-law No. 9024 (permissible noise limits vary according to vehicle speed); and Edmonton By-law No. 4110. 8) Noise limits and targets are measured at 7.5 m except for Edmonton and Calgary levels which are measured at 4.5 m, and Canadian levels measured at 15 m.

The OECD countries, in focusing on cooperation and "harmonization" of noise regulations, are attempting to encourage removal of trade barriers so that product specifications and standards do not differ from country to country. Uniformity of motor vehicle noise emission limits, in particular, is considered essential because of the importance of trade (90 percent of total world cars are within the OECD area), because motor vehicles represent the major source of noise pollution, and because of the current disparity of approaches in Europe, Japan, and the United States. Other noise sources, including aircraft, domestic appliances, construction, and industrial equipment, however, are also the target of coordinated noise abatement efforts. The conference specifically recommended international harmonization of labelling systems to show noise levels of noisy products and equipment, standardized procedures for checking vehicles in use, and integration of noise considerations with urban planning and land use management.

VIEWS AND QUESTIONS

The preceding chapters reveal a multitude of government departments and agencies, at all levels, with varying interests in regulating noise. There are only a few pieces of legislation, however, which specify explicit noise control policies.

Do you consider the current level of government involvement in noise control effective?

It is recognized that views regarding the effectiveness of present noise abatement regulations and policies are shaped by what a person believes to be the appropriate level of government regulation generally. Growing public debate on the issue has focused on at least two distinct points of view: first, that Government interference in our lives should be minimized or second, that Government should assume greater responsibility for ensuring that the public's health and welfare is adequately protected, especially with reference to social and environmental problems.

Proponents of reduced government regulations suggest that market forces will evolve the most efficient and desirable solution. For example, as cited earlier, Swedish and German chainsaw and snowmobile manufacturers effectively responded to public desire for quieter machines leaving less alert Canadian manufacturers at a disadvantage.

An alternative viewpoint argues that certain responsibilities and costs must be assumed by society, and not left to specific consumers or private interests. Regulations protecting workers from the effects of noise are an example of controls justified from this point of view.

Do you accept that some government involvement to achieve reduced noise levels is desirable? If so, what degree of regulation do you consider appropriate?

What division of responsibility among the various levels of Government do you think would be most effective?

The following are a few thoughts and questions regarding allocation of noise control responsibility. These comments are not meant to be definitive. Rather, it is hoped that they will stimulate discussion, in preparation for the upcoming public hearings, on all aspects of the problem of noise and its control in Alberta.

FEDERAL

The Federal Government seems well suited to controlling the noise producing potential of all machinery, for two reasons. First, the federal area of jurisdiction closely matches the market area for most products. Second, because the noise potential of a device is determined by its design and construction, federal certification of new products at the time of their manufacture is relatively easy (NRCC 1972, p. 7). Such certification is presently used by Transport Canada for a number of classes of motor vehicles. Application of this approach to other manufactured noise sources, along with a program to progressively reduce accepted noise levels could have a major impact on reducing noise.

The Federal Government also appears well suited to regulating the operational and maintenance aspects of interprovincial transportation noise, such as aircraft activities and railways.

Do you consider current federal noise abatement programs to be effective?

Do you consider it desirable for the federal government to increase its involvement in noise control?

PROVINCIAL

Provincial governments seem to be the level of government best able to develop intraprovincially uniform regulations respecting the operation and maintenance of noise producing sources, such as construction equipment, industrial sites, and intraprovincial transportation facilities.

Are such regulations desirable?

Provincial governments also are well suited to developing provincially consistent land use policies with respect to noise considerations. Alberta Municipal Affairs' Airport Vicinity Protection Area (AVPA) regulations are an excellent example of this approach. The strength of the approach is that local land use plans and bylaws are required to conform to the AVPA regulations when they are adopted.

Do you think that this approach will reduce noise problems?

Do you think that this approach should be applied to other noise problem areas?

MUNICIPAL/REGIONAL

Municipal and regional levels of government can incorporate noise considerations into municipal and regional land use plans and planning practices. Municipal noise abatement bylaws, however, though enabling communities to reflect local attitudes toward miscellaneous noises, are particularly vulnerable to inertia and political expediency.

How effective are municipal and regional noise control programs in Alberta? How effective could they be?

INTERGOVERNMENTAL COORDINATION/COOPERATION

The multiplicity of government departments and agencies at all levels involved in controlling noise pollution suggests a need for inter-governmental coordination and cooperation. Although a number of examples of such cooperation are identified in this report, greater clarification of mutual interests, and formalization of cooperative practices, where necessary, may improve the efficiency of current noise control practices.

Do you think that there should be increased coordination of noise control activities?

STANDARDS

It appears that noise control requires the development of pertinent and easily utilized standards.

Who should be responsible for developing the desired standards?

RESEARCH

It can be argued that the development of practical noise controls depends not only on good standards, but also on having adequate research.

What types of research do you think are needed? Medical? Technical?
Who should be encouraging and supporting research programs?

EDUCATION/INFORMATION

Finally, it also can be argued that progress in controlling noise requires greater public awareness of the insidious hazards of noise.

Do you agree? Who should be responsible for such a program?

What policies and programs, if any, would you recommend to reduce noise pollution in Alberta?

How important is "quiet" to you?

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